



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/072,176

02/07/2002

Benjamin J. Finn

5538/2012

1323

29933

7590

06/03/2005

PALMER & DODGE, LLP
KATHLEEN M. WILLIAMS
111 HUNTINGTON AVENUE
BOSTON, MA 02199

EXAMINER

FLETCHER, MARLON T

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,176

Applicant(s)

FINN ET AL.

Examiner

Marlon T. Fletcher

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6, 7, 9-25, and 26-31, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghias et al. (5,874,686) in view of Zimmerman et al. (5,563,358).

As recited in claims 1, 23, 24, 28, and 30, Ghias et al. disclose an apparatus and method for searching a database of music files (figure 1), comprising: input means (20) to provide search criteria comprising a tune as a sequence of melodic intervals; comparing means (24), for comparing said sequence of melodic intervals with selected portions of a plurality of computer-readable music file (column 2, lines 50-52); and output means (26), to provide a list of possible matches of said search criteria with at least one of said plurality of computer-readable music files (column 2, lines 50-52). Ghias et al. disclose a computer program product, comprising a computer readable medium having thereon computer program code means adapted, such that when said program is loaded onto a computer (figure 1).

As recited in claim 2, Ghias et al. disclose the apparatus, wherein said input means comprises a microphone (20) into which a user can sing, hum or whistle said tune (column 2, lines 41-42).

As recited in claim 3, Ghias et al. disclose the apparatus, wherein said input means comprises a MIDI keyboard for playing the tune (column 7, lines 57-61).

As recited in claim 4, Ghias et al. disclose the apparatus, wherein the input means further includes a pitch recognition means (22) to identify each melodic interval between a succession of musical pitches input as said tune.

As recited in claims 9 and 10, Ghias et al. disclose the apparatus, wherein said comparing means includes means for comparing one or more segments of said tune with said selected portions of said plurality of computer readable music files, and wherein said output means bases the likelihood of a match on the number of separate segments and/or selected portions for which a possible match is indicated, wherein said segments of the search tune and/or said selected portions of the music file are defined as overlapping note sequences (column 2, line 27-34; and column 5, line 66 through column 7, line 8).

As recited in claim 11, Ghias et al. disclose the apparatus according to claim 1 wherein said comparing means includes: means for representing the input sequence of melodic intervals, and b) the selected portions of said plurality of computer-readable music files, each as a function of pitch against time, and means for measuring a closeness of fit to determine a degree of matching of the input sequence to each one of the selected portions (column 2, lines 27-34 and lines 47-56; and column 3 through column 5).

As recited in claims 12, 13, and 29, Ghias et al. disclose the apparatus, further including transformation means for applying at least one transformation function for

Art Unit: 2837

measuring a closeness of fit, wherein said at least one transformation function comprises any one of: a translation in pitch; a translation in time; a scaling in time; a variable scaling in time over different parts of the graph; a variable pitch translation over different parts of the graph; and a transformation by removal of selected sections from the graph (column 3, line 61 through column 4, line 26).

As recited in claim 14, Ghias et al. disclose the apparatus, wherein said means for measuring closeness of fit comprises means for determining an error score for a note input sequence compared against a note selected portion of said music file for each of a plurality of values (column 2, lines 52-59).

As recited in claims 15 and 16, Ghias et al. disclose the apparatus, further including means for determining a value of n for which the error score is minimized, further including means for varying n about a start value until an error score minimum is attained (column 6, line 3 through column 7, line 56).

As recited in claim 17, Ghias et al. disclose the apparatus, wherein said comparing means includes to identify relevant selected portions of a plurality of computer-readable music files by applying selection criteria to identify portions of the files likely to contain tunes (column 2, lines 47-52; and column 5, line 66 through column 6, line 2).

As recited in claim 18, Ghias et al. disclose the apparatus, wherein said relevant selected portions of said music files are stored in an index (column 2, lines 60-63).

As recited in claim 19, Ghias et al. disclose the apparatus, wherein said relevant selected portions stored in said index are encoded as text, said input means further

including means for encoding said sequence of melodic intervals as text string, and said comparing means comprising a text search engine (column 6, lines 23-63).

As recited in claim 20, Ghias et al. disclose the apparatus, wherein the location, in said computer-readable music files, of said relevant selected portions of said music files are indicated by one or more tags, and said comparing means are adapted to locate said tags which is inherent and further discussed in column 3, lines 3-7.

As recited in claim 21, Ghias et al. disclose an apparatus for indexing a music database comprising: means (24) for identifying relevant selected portions of a plurality of computer-readable music files by applying criteria to identify portions of the files likely to contain tunes; and means for tagging said music files to identify positions corresponding to said relevant selected portions (column 2, lines 47-52; and column 3, lines 3-7).

As recited in claim 22, Ghias et al. disclose an apparatus for indexing a music database comprising: means for identifying relevant selected portions of a plurality of computer-readable music files by applying selection criteria to identify portions of the files likely to contain tunes (column 2, lines 47-52); and means for generating an index of said music files containing information representative of said relevant selected portions (column 6, line 60 through column 7, line 8).

As recited in claim 25, Ghias et al. disclose an apparatus for determining a sequence of melodic intervals from an input source comprising: input means for providing an input signal waveform representing a tune; note discretization means comprising means for dividing a frequency-time representation of said input signal

waveform into discrete time periods to form a succession of input tune elements and, for each input tune element, determining a single gradient of the input over said time period (column 3, line 61 through column 5, line 65).

As recited in claim 25, Ghias et al. disclose the apparatus, wherein said comparing means further includes means to identify relevant selected portions of said audio files likely to contain tunes by detecting a component of the audio signal which is common to both left and right channels of a stereo pair of channels (inherent in view of that discussed above).

Ghias et al. do not disclose determining a chromatic interval.

However, Zimmerman et al. (claims 1, 6, 7, 21, 22-25) disclose teaching or training means, wherein said input means further includes quantization means to determine a closest chromatic interval, a closest whole tone interval, or a closest minor or major third interval between two successive musical pitches; wherein said input means further includes quantization means to determine a closest major, minor or other scale to which successive musical pitches will fit; further including means to determine, from said input sequence of melodic intervals, a succession of rhythmic intervals and use said succession of rhythmic intervals as further search criteria (column 9, lines 1-28 and column 16, line 44 through column 17, line 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Zimmerman with the apparatus of Ghias et al., because Zimmerman et al. provide the teachings of using a chromatic interval as part of comparing and pitch matching techniques, which provides more information for

providing a match in melodies or tunes. Obviously this technique could be utilized with the teachings of Ghias et al., wherein the tunes could be further matched by chromatic interval for searching the database for musical files; thereby providing optional means for searching.

Ghias et al. (claims 26 and 27) do not disclose means for designating the gradient of each element as one of the categories selected from the group consisting of: horizontal / near horizontal; diagonal; and vertical / non-vertical; and means for coalescing adjacent elements of the same category to form compound elements.

However, Official Notice is taken with respect to it being well known in the art to use the gradient and related components for determining points or comparison of an input signal over a period of time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the well known teachings in the art with the apparatus of Ghias et al., because using the gradient of the input signal and stored signals provides more accuracy in the method determining a match between signals.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghias et al. in view of Zimmerman et al. as applied to claims 1-4, 6, 7, 9-25, and 28-31 above, and further in view of Lybrook et al. (4,731,847).

Ghias et al. and Zimmerman et al. are discussed above and do not disclose the use of text as the input.

However, Lybrook et al. disclose an apparatus, including means (103) to provide as input additional search criteria comprising text information (figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings Lybrook et al. with the teachings of Ghias et al. in view of Zimmerman et al., because the teachings allow for an alternative input, wherein text can be used as an input to the system.

Response to Arguments

4. Applicant's arguments filed 03/14/2005 have been fully considered but they are not persuasive.


The applicants argue that the prior art fails to teach searching a database based on an input which includes determining a chromatic interval as search criteria. Ghias et al. do not provide this teaching. However, Ghias et al. disclose a melody which is input through a microphone and the database is searched based on the inputted melody. Inherently that melody would contain intervals, defined as different pitches between different notes. Zimmerman et al. provides a matching of tunes by pitch which includes matching a chromatic interval. It would be an obvious modification to provide Ghias et al. with this teaching, wherein beyond simple melody (and pitch thereof), the apparatus could also provide pitch matching by chromatic interval, which would further enhance the apparatus by allowing more criteria for accurately searching the database. In combination the references meet the claim limitations argued, wherein all other limitations are met as provided above.

Art Unit: 2837

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-W, F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Marlon T. Fletcher
Primary Examiner
Art Unit 2837

MTF
May 31, 2005